

REMARKS

Claims 1-6 and 8-23 are currently pending in the present application. Claims 1, 3, 8-11, 17 and 21 have been amended. Claims 2 and 16 have been canceled. Claim 7 previously was canceled. No claims have been added. Therefore, claims 1, 3-6, 8-15 and 17-23 will be pending in the application after entry of the foregoing claim amendments. Support for the amendments is found in the specification, drawings, and claims as originally filed. Applicants respectfully submit that no new matter has been added.

Interview Summary

Applicants gratefully acknowledge the time and attention afforded by Examiner Gortayo during a telephonic interview on November 19, 2008. During the interview, Examiner Gortayo agreed that the present claim amendments overcame the claim rejections over the cited Manikutty reference.

Claim Rejections – 35 U.S.C § 103

Claims 1-6 and 8-23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 7,120,645 to Manikutty et al. (hereinafter “Manikutty”) in view of Shanmugasundaram et al. (“Relational Databases for Querying XML Documents: Limitations and Opportunities”) (hereinafter “Shanmugasundaram”). Although Applicants believe that the present claims patentably define over Manikutty in view of Shanmugasundaram, Applicants have amended the claims to further clarify the claimed subject matter.

The cited portions of Manikutty and Shanmugasundaram fail to disclose or suggest the specific combination of independent claim 1. For example, the cited portions of Manikutty and Shanmugasundaram fail to disclose or suggest (1) defining a plurality of nodes of a rooted graph structure which represents at least one XML language inquiry, the rooted graph structure having at least one node object for every operation within the at least one XML language inquiry, and (2) translating each of the at least one node objects using intermediate language operators represented by a unique corresponding node type and class, wherein there are multiple node types per class and one class per node type, as in claim 1.

More specifically, Manikutty is directed to techniques for rewriting XML queries directed to relational database constructs. In Manikutty, a received database command includes an XML component operation that operates on an XML construct that is based on a first set of one or more relational database constructs. Manikutty then determines whether the XML component operation can be transformed to a relational database operation on a particular set of one or more relational database constructs of the first set, which does not involve the XML component operation. If it is determined that the XML component operation can be transformed, then the XML component operation is rewritten as a particular relational database operation that operates on the particular set and that does not involve the XML component operation. The particular relational database operation is then evaluated. See Manikutty, Abstract. Manikutty does not disclose the rooted graph structure as claimed. Rather, Manikutty discloses a normalized tree. See Manikutty, col. 20, line 63 – col. 21, line 44.

Further, Manikutty does not disclose a translation of node objects using intermediate language operators represented by a unique corresponding node type and class, wherein there are multiple node types per class and one class per node type. Instead, Manikutty discloses:

“In step 320, it is determined whether the query can be rewritten to replace one or more XML operations with one or more SQL operations on the data stored in the relational or object-relational constructs. In some embodiments, determining whether the query can be rewritten includes determining how to rewrite the query. Step 320 is described in more detail in a later section with reference to FIG. 4.

Step 330 represents a branch point in the flow. If it is determined in step 320 that the query can be rewritten to remove one or more XML operations, then control passes to step 340 to rewrite the query. Otherwise, the query is not rewritten and control passes to step 350 to begin processing the original query.

In step 340, the query is rewritten to eliminate one or more XML operations. In some embodiments, in which it is determined how to rewrite the query during step 320, step 320 overlaps steps 330 and 340 in time.”

Manikutty, col. 16, line 59 – col. 17, line 8.

In other words, Manikutty is describing a prior art process of rewriting a query to replace XML operations with SQL operations where possible. Thus, Manikutty fails to disclose a translation using intermediate language operators as claimed.

Shanmugasundaram is cited in the Office Action as allegedly teaching a semantic representation including a tuple operation that includes three nodes (Office Action at p. 4). Applicants respectfully submit, therefore, that the cited portions of Shanmugasundaram fail to remedy the foregoing deficiencies of Manikutty.

Accordingly, for at least foregoing reasons, Applicants respectfully submit that claim 1 patentably defines over Manikutty and Shanmugasundaram. As claims 3-6 and 8-10 depend from claim 1, Applicants further submit that these claims patentably define over Manikutty and Shanmugasundaram at least by virtue of their dependence from claim 1.

The subject matter of claim 1 discussed above is similarly recited in independent claims 11, 17 and 21. Thus, Applicants respectfully submit that claims 11, 17 and 21 patentably define over Manikutty and Shanmugasundaram for at least the same reasons as claim 1. As claims 12-15 depend from claim 11, claims 18-20 depend from claim 17, and claims 22 and 23 depend from claim 21, Applicants further submit that these claims are allowable at least by virtue of their dependence from one of the independent claims.

In addition, claims 1, 12 and 17 recite additional features that are not disclosed by the cited portions of Manikutty and Shanmugasundaram. For example, the cited portions of Manikutty and Shanmugasundaram fail to disclose or suggest expressing a meaning of one or more of an XML query and an XML view across relational and non-relational data sources, as in claim 12. In this regard, Manikutty discloses:

In addition to, or instead of, mappings 142 and XML type object-relational construct 144; the database server 130 may also store on database storage space 140 a legacy database 150. In the legacy database, the tables are not directly related to an XML construct through a mapping 142. For example the data may have been stored and used in multiple applications before DEPT type XML documents were defined in schema 102. In the illustrated embodiment, the legacy database 150 includes a DPT table and an EMP table. The DPT table includes columns with column names DPTNO, DPTNA, DPTLO, and DPTMGR to store data that represents department number, department name, department location and department manager, respectively. One or more of these columns may be object types of an object-relational database; for example, column DPTLO may include objects of ADDRESS type. The EMP table includes columns

with column names EMPNO, EMPNA, DPTNO and EADD, among others, to store data that represents employee number, employee name, employee department, employee address, among others, respectively.

Manikutty, col. 8, lines 58 – col. 9, line 10. As indicated in the foregoing portions of Manikutty, Manikutty's legacy database 150 is an object-relational database, not a non-relational database as claimed. Therefore, Manikutty fails to disclose expressing a meaning of an XML query across a non-relational data source. Applicants respectfully submit that the cited portions of Shanmugasundaram fail to remedy the foregoing deficiencies of Manikutty.

Accordingly, Applicants respectfully submit that claim 12 patentably defines over Manikutty and Shanmugasundaram for at least this additional reason. The subject matter of claim 12 discussed above is similarly recited in independent claims 1 and 17. Thus, Applicants further submit that claims 1 and 17 also patentably define over Manikutty and Shanmugasundaram for at least this additional reason.

Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1, 3-6, 8-15 and 17-23 under 35 U.S.C. § 103(a).

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PATENT

CONCLUSION

In view of the foregoing, Applicants respectfully submit that the claims are allowable and that the present application is in condition for allowance. Reconsideration of the application and an early Notice of Allowance are respectfully requested. In the event that the Examiner cannot allow the present application for any reason, the Examiner is encouraged to contact the undersigned attorney, Michael P. Dunnam, at (215) 564-3100 to discuss the resolution of any remaining issues.

Respectfully submitted,

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/Michael P. Dunnam/
Michael P. Dunnam
Registration No. 32,611

Woodcock Washburn LLP
Cira Centre
2929 Arch Street, 12th Floor
Philadelphia, PA 19104-2891
Telephone: (215) 568-3100
Facsimile: (215) 568-3439